

WHAT IS CLAIMED:

1. A purified human nucleic acid comprising SEQ ID NO 3, or the complement thereof.

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2. The purified nucleic acid of claim 1, wherein said nucleic acid comprises a region encoding SEQ ID NO 4.

10 3. The purified nucleic acid of claim 1, wherein said nucleotide sequence encodes a polypeptide consisting of SEQ ID NO 4.

4. A purified polypeptide comprising SEQ ID NO 4.

15 5. The polypeptide of claim 4, wherein said polypeptide consists of SEQ ID NO 4.

6. An expression vector comprising a nucleotide sequence encoding SEQ ID NO 4, wherein said nucleotide sequence is transcriptionally coupled to an exogenous promoter.

20 7. The expression vector of claim 6, wherein said nucleotide sequence encodes a polypeptide consisting of SEQ ID NO 4.

8. The expression vector of claim 6, wherein said nucleotide sequence comprises SEQ ID NO 3.

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9. The expression vector of claim 6, wherein said nucleotide sequence consists of SEQ ID NO 3.

30 10. A method for screening for a compound able to bind to BACE2sv2 comprising the steps of:

- (a) expressing a polypeptide comprising SEQ ID NO 4 from recombinant nucleic acid;
- (b) providing to said polypeptide a test preparation comprising one or more test compounds;
- (c) and measuring the ability of said test preparation to bind to said polypeptide.

11. The method of claim 10, wherein said steps (b) and (c) are performed *in vitro*.

5 12. The method of claim 10, wherein said steps (a), (b), and (c) are performed using a whole cell.

10 13. The method of claim 10, wherein said polypeptide is expressed from an expression vector.

14. The method of claim 10, wherein said polypeptide consists of SEQ ID NO 4.

15 15. A method of screening for compounds able to bind selectively to BACE2sv2 comprising the steps of:

- (a) providing a BACE2sv2 polypeptide comprising SEQ ID NO 4;
- (b) providing one or more BACE2 isoform polypeptides that are not BACE2sv2;

20 (c) contacting said BACE2sv2 polypeptide and said BACE2 isoform polypeptide that is not BACE2sv2 with a test preparation comprising one or more compounds; and

25 (d) determining the binding of said test preparation to said BACE2sv2 polypeptide and to said BACE2 isoform polypeptide that is not BACE2sv2, wherein a test preparation which binds to said BACE2sv2 polypeptide, but does not bind to said BACE2 polypeptide that is not BACE2sv2, contains a compound that selectively binds said BACE2sv2 polypeptide.

30 16. The method of claim 15, wherein said BACE2sv2 polypeptide is obtained by expression of said polypeptide from an expression vector comprising a polynucleotide encoding SEQ ID NO 4.

17. The method of claim 16, wherein said polypeptide consists of SEQ ID NO 4.

35 18. A method for screening for a compound able to bind to or interact with a BACE2sv2 protein or a fragment thereof comprising the steps of:

(a) expressing a BACE2sv2 polypeptide comprising SEQ ID NO 4 or fragment thereof from a recombinant nucleic acid;

(b) providing to said polypeptide a labeled BACE2 ligand that binds to said polypeptide and a test preparation comprising one or more compounds; and

5 (c) measuring the effect of said test preparation on binding of said labeled BACE2 ligand to said polypeptide, wherein a test preparation that alters the binding of said labeled BACE2 ligand to said polypeptide contains a compound that binds to or interacts with said polypeptide.

10 19. The method of claim 18, wherein said steps (b) and (c) are performed *in vitro*.

20. The method of claim 18, wherein said steps (a), (b) and (c) are performed using a whole cell

15 21. The method of claim 18, wherein said polypeptide is expressed from an expression vector

20 22. The method of claim 18, wherein said BACE2sv2 ligand is an aspartyl protease inhibitor.

23. The method of claim 21, wherein said expression vector comprises SEQ ID NO 3 or a fragment of SEQ ID NO 3.

25 24. The method of claim 21, wherein said polypeptide comprises SEQ ID NO 4 or a fragment of SEQ ID NO 4.